



Workshop Report

2016 International Workshop on the Conservation and Restoration of Earthen Architecture
or
TICRAT (Taller Internacional de Conservación y Restauración de Arquitectura de Tierra)



NPS Photo by Patrick Driscoll

March 14-18, 2016
Tumacácori, Arizona



Submitted by:
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Tumacácori National Historical Park

WORKSHOP SUMMARY

From March 14-18, Tumacácori National Historical Park hosted 100 participants in the 2016 Taller Internacional de Conservación y Restauración de Arquitectura de Tierra (TICRAT). Also known as the International Workshop on the Conservation and Restoration of Earthen Architecture, TICRAT is a bi-national, hands-on workshop focused on learning the traditional techniques and materials of conserving earthen architecture, adobe, lime plaster, and painted architectural finishes. The workshop series was started in 1994 in partnership with Mexican counterparts with INAH (Instituto Nacional de Antropología e Historia). Each year, the workshop alternates being held in the United States and Mexico, with all sessions taught in English and Spanish.

In celebration of the NPS Centennial, this year's TICRAT involved more partners than any previous event. The workshop was attended by 37 NPS employees from 14 parks and five states, along with IMR and WASO staff. Additional participants came from INAH's protected sites; tribal organizations; non-profits; six U.S. universities; two Mexican universities; private industry; and federal, state, and county government agencies. The event was coordinated to highlight cross-border as well as domestic partnerships with workshop stations held at Empire Ranch (Bureau of Land Management), Tubac Presidio State Historic Park (Arizona State Parks), Historic Hacienda de la Canoa (Pima County Natural Resources, Parks and Recreation), and Mission San Xavier del Bac (Tucson Diocese of the Catholic Church & Tohono O'odham Indian Reservation).

This year's event also included presentation of the Director's Partnership Award to R. Brooks Jeffery, Director of the Drachman Institute and Chair of the Heritage Conservation Program at the University of Arizona. The award was presented by Dr. Stephanie Toothman (Associate Director of Cultural Resources, Partnerships, and Science) to recognize Mr. Jeffery's 15-year partnership with the NPS, the Desert Southwest Cooperative Ecosystems Study Unit (DS-CESU), and facilitation support of the TICRAT workshops. Additional dignitaries included José Luis Perea González (INAH State Director for Sonora), Francisco Rios (INAH State Director for Sinaloa), and Tom Lincoln (IMR Assistant Regional Director for Cultural Resources). Coordination for this year's TICRAT was provided by Tumacácori National Historical Park. Funding was provided by the Southwest Border Resource Protection Program through the Desert Southwest CESU.

BACKGROUND

Developed by NPS preservation staff and colleagues from INAH (Instituto Nacional de Antropología e Historia), TICRAT offers hands-on field opportunities for preserving fragile earthen architecture. Numerous historic earthen architecture sites within the NPS suffer from neglect and historical use of incompatible preservation materials and techniques. The workshop is designed to bring together experts from the NPS, INAH, universities, non-profits, and the private sector to share information and skills related to preservation. Through the course of the workshop, participants transform worksites from once deteriorating and collapsing historic structures to well-preserved sites capable of withstanding the impacts of weathering, neglect, and damage.

Through the TICRAT workshops, the NPS builds the skillsets of preservation staff while improving the consistency and quality of preservation practices being used across protected sites. Students in the U.S. and Mexico participate from a breadth of disciplines including architecture, engineering, archeology, planning, landscape architecture, and historic preservation. These students are given exposure to leading preservation specialists in their fields and become advocates for the work of the NPS and INAH. This field-based training and collaboration with diverse partners builds the capacity of NPS staff to enhance the protection of NPS resources and sites.

PARTICIPATING ORGANIZATIONS

Partnering Federal Agencies

Bureau of Land Management

Forest Service

Pima County Natural Resources, Parks and Recreation
Historic Hacienda de la Canoa

Arizona State Parks

Tubac Presidio State Historic Park

Instituto Nacional de Antropología e Historia

State Division of Morelos

State Division of Sinaloa

State Division of Sonora

National Park Service

Arches National Park

Canyonlands National Park

Channel Islands National Park

Desert Southwest Cooperative Ecosystems Studies Unit

Intermountain Region Office

Fort Bowie National Historic Site

Fort Union National Monument

Hovenweep National Monument

Montezuma Castle National Monument

Natural Bridges National Monument

Salinas Pueblo Missions National Monument

Santa Fe IMR Archeology Program

Santa Fe Historical Preservation Program

Sunset Crater Volcano National Monument

Tumacácori National Historical Park

Tuzigoot National Monument

Vanishing Treasures Program

Walnut Canyon National Monument

Washington Office

Wupatki National Monument

Non-profits

California Missions Foundation

Empire Ranch Foundation

Friends of Tucson's Birthplace

Pimeria Alta Historical Society

Tucson Diocese of the Catholic Church

Patronato San Xavier

Private Industry

IS Architecture

Pat Taylor Inc.

Vint & Associates

Tribes & Affiliated Organizations

Fort Apache Heritage Foundation, Inc

Sustainable Nations

Tohono Restoration

Tohono O'odham Indian Reservation

Universities - Mexico

Universidad Autónoma Metropolitana - Xochimilco

Universidad de Colima

Universities – United States

Columbia University

University of Arizona
University of Colorado - Denver
University of New Mexico
University of Oregon
University of Pennsylvania

SUMMARY OF EVENTS

March 14th , Monday

Best Western Hotel, Green Valley

- TICRAT Registration
- Welcome Reception

March 15th, Tuesday

Tumacácori National Historical Park, NPS and Tubac Presidio State Park, State of Arizona

- Opening Ceremony
- Introduction to Earthen Materials, Part I: Soil
- Building Assessment: Convento
- Adobe Wall Stabilization and Repair
- Building Assessment & Stabilization Treatments Tour
- Picnic Lunch in TUMA

March 16th, Wednesday

Empire Ranch, Bureau of Land Management

- Cement Plaster Removal and Wall Assessment
- Mud/Lime Plaster Application
- Adobe Wall Repair
- Interior Plaster Repair and Patching
- Chuck Wagon Lunch

March 17th, Thursday

Historic Hacienda de la Canoa, Pima County

- Adobe Wall Construction
- Introduction to Earthen Materials, Part II: Lime Cycle
- Lime Plaster Application
- Wall Removal and Mud-work
- Live Music and Dinner

March 18th, Friday

Tumacácori National Historical Park, NPS

- Painted Surface Finishes (Presentation)
- Demonstration of Surface Finishes Treatment
- Guided Tour of Ongoing Preservation Projects at TUMA
- Visit to Mission San Xavier del Bac
- Closing Ceremony

Day 1: Tumacácori National Historical Park (Opening Ceremony and Modules A & B)

Mission San Jose de Tumacácori is a Spanish Colonial Franciscan adobe church, originally founded by Father Eusebio Kino. Built between 1801-1848, it was declared a National Monument in 1908 and is protected by the National Park Service.

Opening Ceremony

Dr. Stephanie Toothman, Associate Director for Cultural Resources, Partnerships and Science, made a special appearance to commemorate the 100th Anniversary of the National Park Service and to kick off the workshop. Professor R. Brooks Jeffery was presented with 2016 NPS Director's Partner Award for his 15-year partnership with the NPS, the Desert Southwest Cooperative Ecosystems Study Unit (DS-CESU), and facilitation support of the TICRAT workshop. Additional participants in the opening ceremony and awards presentation included Alex B. Lim (TUMA Exhibits Specialist), Tom Lincoln, IMR Regional Assistant Director for Cultural Resources, TUMA Superintendent Bob Love, and two dignitaries from INAH, José Luis Perea González (State Director for Sonora) and Francisco Rios (State Director for Sinaloa).



Clockwise from top left: Mission San Jose de Tumacácori facade; Opening ceremony at Tumacácori; Mexico INAH Sonora José Luis Perea González congratulating the U.S. and Mexico partnership with translation help from Francisco Uviña. NPS photos by Maggie Zamarripa



Presentation of the 2016 NPS Director's Partnership Award (from left: Bob Love - TUMA Superintendent, Dr. Toothman, R. Brooks Jeffrey, Tom Lincoln - IMR Assistant Regional Director for Cultural Resources). NPS Photo by Maggie Zamarripa.

Module A: Introduction to Earthen Materials, Part 1. Soil
Characterize soil and make sun-dried bricks.



Clockwise from top left: (from left) Frida M., Tom L., and Katerina V. making soil extrusions to test for plasticity; (from left) Kate G., Eloy W., Patrick R. and Andrew V. testing soil mix; (from left in uniform) Billy O., Sean H., and Ray M. making adobes as Dr. Toothman looks on. NPS Photos by Maggie Zamarripa.

Module B: Building Assessment (Convento Ruin)

Review earthen architecture conditions and graphically annotate them based on the glossary of conditions



Lorena T. and Sheldon B. (foreground) reviewing the glossary of conditions. NPS photo by Maggie Zamarripa



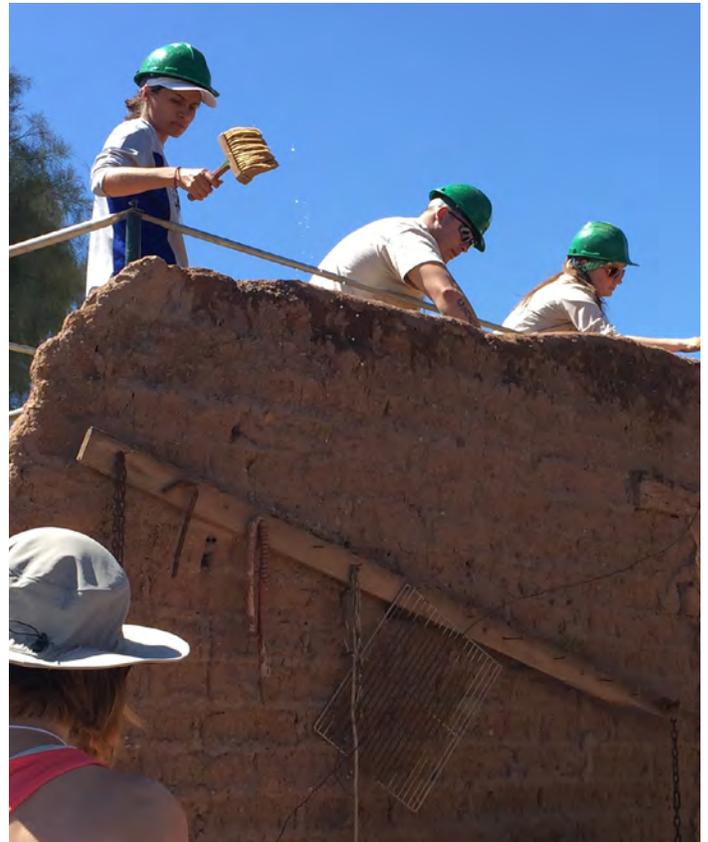
(From left) Sarah R. and Bryana W. recording wall condition. NPS Photo by Maggie Zamarripa.

Day 1: Tubac Presidio State Park (Modules C & D)

Tubac Presidio State Park consists of the ruin of Spanish presidio (fort) founded in 1752 and late 1800's adobe houses of the town of Tubac, including the ruin of Tack House. The community of Tubac has protected the site through Public-Private partnership with the state of Arizona since 2010.

Module C: Adobe Wall Stabilization and Repair (Tack House)

Introduction to basal repair and wall capping



Clockwise from top left: (from left) Kristina C., Bill O., and Chris S. reconstructing an adobe wall; Erica A., Jose C., and Nicole L. stabilizing wall top; Alex N. and Isaac R. examining adobe wall. NPS Photos by Maggie Zamarripa.

Module D: Building Assessment and Stabilization Treatments Tour (Pennington House)
Review of treatment strategies for vernacular earthen architecture



David Y. (seated) sharing the history of the Pennington House. NPS Photo by Adam Springer



(From left) Pat T., Eirini B., Vincente G., Rachelle H., and Elizabeth P. examining wall base. NPS Photo by Maggie Zamarripa

Day 2: Empire Ranch (Modules E, F, G, and H)

Empire Ranch is a working cattle ranch consisting of several adobe structures including the main Ranch House and Hay Barn, among others. It was one of the largest in Arizona. Since 1988, it has been administered by the Bureau of Land Management in collaboration with the Empire Ranch Foundation.

Module E: Cement Plaster Removal and Wall Assessment (Ranch House)

Removing failing stucco and examining conditions



Top: (from left) Chris S. and Ray M. examining deteriorating wall base

Bottom: (from left) Donald H. and Tania A. applying soil render. NPS Photos by Alex Lim

Module F: Mud/Lime Plaster Application (Ranch House)
Treatment of eroded adobe wall base



Top: Katerina V. dry mixing clay and sand.
Bottom: (from left) Donelle H. and Dempsey Q. applying soil render. NPS Photos by Alex Lim

Module G: Adobe Wall Repair

Techniques for tuck pointing and soil plaster edging



Top: Students tuck pointing adobe wall

Bottom: (from left) Bob H., Erica A., and Jessica B. tuck pointing. NPS Photos by Adam Springer

Module H: Interior Soil Plaster Repair and Patching
Techniques for assessing and repairing interior soil plaster



Top: (from left) Francisco U. and Luis F. characterizing soil size using readily available plastic bottle.
Bottom: Francisco U. exploring the causes of structural cracks. NPS Photos by Alex Lim

Day 3: Historic Hacienda de la Canoa (Modules I, J, K, and L)

Hacienda de la Canoa was established in 1821. The existing structures were built by the Manning family in the early 1900's. Pima County Natural Resources, Parks and Recreation division and site volunteers take care of the site.

Module I: Adobe Wall Construction (Boundary Wall)

Building an adobe wall



Nicole L. building an adobe wall. NPS Photo by Adam Springer



Students finishing up the adobe wall. NPS Photo by Alex Lim

Module J: Introduction to Earthen Materials, Part II: Lime

Basics of lime and the use of cactus mucilage, soap and alum to extend lime service life



Clockwise from top left: (from left) Luis F. and Todd S. evaluating lime putty; (from left) Eloy W., Luis F., Fernando R., and Erica A. examining lime polish; (from left) Adam S., Jessica B., and Erin G. listening to the instructors. NPS Photos by Alex Lim

Module K: Lime Plaster Application (Foreman House)

Safety instruction on the use of lime, mixing techniques, and application on adobe wall



Top: Francisco U. and Pat T. checking the wind condition with a handful of soil during lime mixing.
Bottom: Mark A. applying lime render. NPS Photos by Alex Lim

Module L: Wall Removal and Mud-Work (Courtyard Site Walls)

Removal of failing plaster, assessment, and soil rendering



Top: (from left against the wall) Richard H. and Simon H. reviewing the drying soil render. NPS Photo by Adam Springer

Bottom: (from left) Katerina V., Gabrielle M., Sheldon B., and Vanessa F. throwing mud balls onto adobe wall. NPS Photo by Alex Lim

Day 4: Tumacácori National Historical Park (Module M and Closing Ceremony)

Module M: Architectural Surface Finishes

Review of methodologies for investigation and characterization of surface finishes and treatment demonstration



Top: Presentation on Mission San Jose de Tumacácori Facade conservation project

Bottom: Frank M. demonstrating the use of hydraulic lime for injection grouting. NPS Photos by Adam Springer

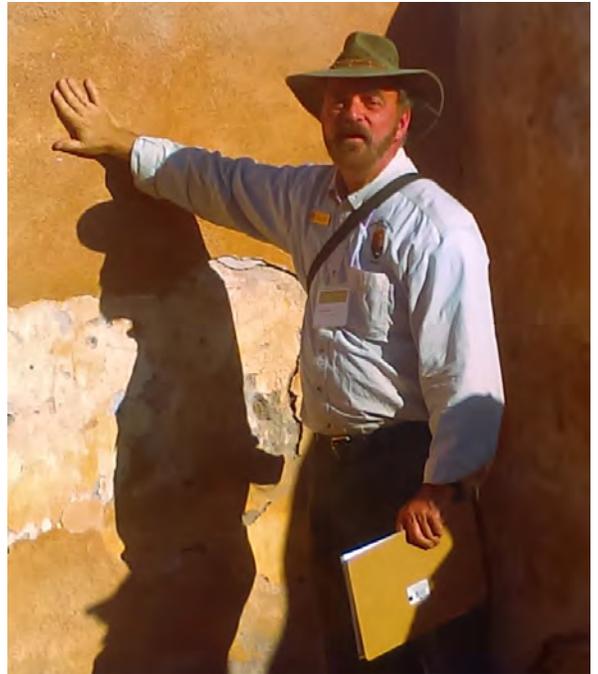
Closing Ceremony

2016 TICRAT ended with certificate hand-out by José Luis Perea González (INAH Sonora), R. Brooks Jeffery (the University of Arizona), and Bob Love (TUMA Superintendent).



Top: Maureen M., 2016 TICRAT program assistant, receiving the workshop certificate and special recognition
Bottom: Isaac R. showing his workshop certificate. NPS Photos by Adam Springer

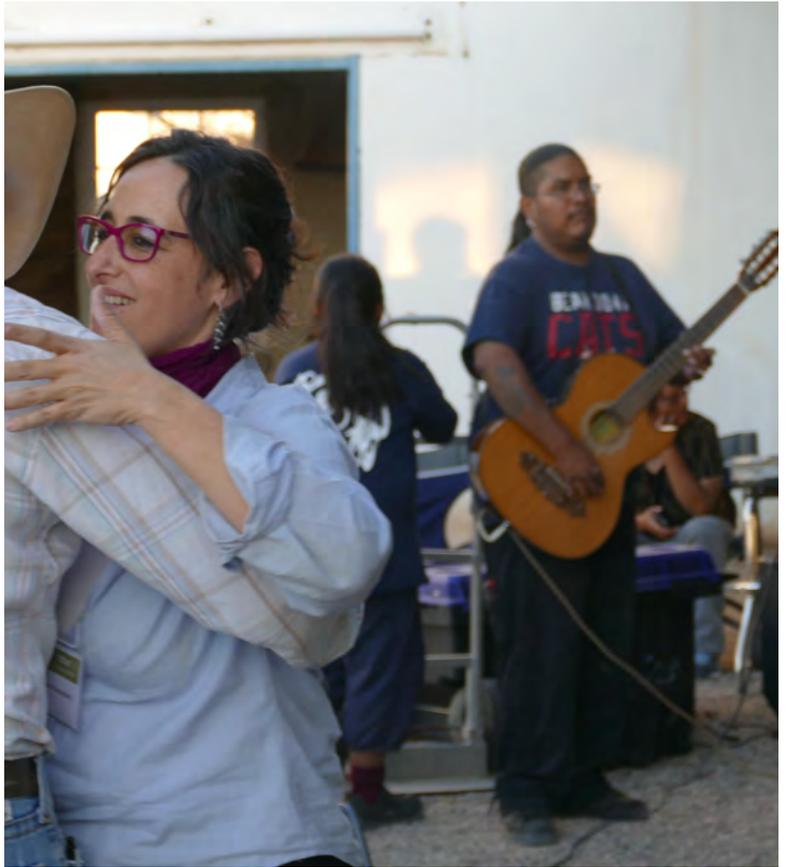
Additional Photographs from 2016 TICRAT Workshop



Clockwise from top left: Greg Kleppinger; Ann Galer; Randy Skeirik; Maureen McDonald and the Empire Ranch Foundation Volunteers; Cab Belk and Lori Thwaite; Stacy Tomczyk; and Norman Albert. NPS Photos by Adam Springer and Alex Lim



Clockwise from top left: Shaw Kinsley of Tubaci Presidio State Park; Alex La Pierre (TUMA); Francisco Lopez (TUMA); (from left) Billy Olivarrria and Ray Madril (TUMA); Alex B. Lim (TUMA); and Maggie Zamarripa (TUMA Intern). NPS Photos by Alex Lim and Adam Springer



Lopez Waila Band from San Xavier Indian Reservation performing at Canoa Ranch dinner, NPS Photos by Alex Lim



Clockwise from top left: Gabriell Miller; Ian Hough; (from left) Adam Springer, Bob Love, Isaac Romero, and Francisco Rios; Martín Terán Danzós; and Alaa Eddin Arar. NPS Photos by Alex Lim



Clockwise from top left: Eric Herrera and Martín Terán; Eirini Boutasi; (from left) Roger Portillo and Lauren Meyer; and (from left) Noreen Fritz and Sarah Reddan. NPS Photos by Alex Lim



Top: (from left) Luis Fernando Guerrero Baca, Todd Scarbraugh, Nicole Lavelly, and Andrea Sforza
Bottom: Cab (Charlie) Belk. NPS Photos by Alex Lim



Clockwise from top left: (from left) Frida Mateos and Luis Fernando Guerrero Baca; Chris Schrager; David Yubeta; and (from left) Pat Taylor and Francisco Uviña Contreras. NPS Photos by Alex Lim